

# **Annual Groundwater Monitoring Status Report for Waste Area Group 5 for Fiscal Year 2006**

June 2006

**Idaho  
Cleanup  
Project**

The Idaho Cleanup Project is operated for the  
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## **Annual Groundwater Monitoring Status Report for Waste Area Group 5 for Fiscal Year 2006**

**June 2006**

**Idaho Cleanup Project  
Idaho Falls, Idaho 83415**

Prepared for the  
U.S. Department of Energy  
Assistant Secretary for Environmental Management  
Under DOE Idaho Operations Office  
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## **ABSTRACT**

This report presents analytical and water level data for Fiscal Year 2006, the sixth year of post-record of decision monitoring. The groundwater monitoring was completed to partially fulfill requirements delineated in the final *Record of Decision for Power Burst Facility and Auxiliary Reactor Area* in support of groundwater monitoring requirements at Waste Area Group 5 at Idaho National Laboratory. Sample collection and analysis requirements are defined in the *Groundwater Monitoring Plan for the Waste Area Group 5 Remedial Action* and in the Record of Decision. The Record of Decision (signed February 2000) requires that surveillance monitoring of the groundwater underlying the Auxiliary Reactor Area and Power Burst Facility must be conducted annually at least until the first five-year review, which was completed in Fiscal Year 2005. Recommendations in the five-year review included eliminating sampling for anions and radionuclides and reducing the number of wells sampled for volatile organic compounds to three.

Groundwater samples were collected from eight wells during the annual sampling effort in November–December 2005 for Fiscal Year 2006. Three wells were sampled for volatile organic compounds and eight wells were sampled for inorganics (metals). No analyte exceeded a maximum contaminant level, a secondary maximum contaminant level, or an Environmental Protection Agency action level. Lead concentrations in past sampling events exceeded the Environmental Protection Agency action level, but lead concentrations found during the current sampling event are below the action level for lead. Lead concentrations decreased after replacement of the galvanized riser pipes. In addition to analytical data, groundwater levels were measured at 20 wells and a water level contour map was generated. The water level map is consistent with previous maps.



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## **ACRONYMS**

amsl	above median sea level
ARA	Auxiliary Reactor Area
bbc	below brass cap
bgs	below ground surface
CFA	Central Facilities Area
CITRC	Critical Infrastructure Test Range Complex
DEQ	Department of Environmental Quality (Idaho)
EPA	U.S. Environmental Protection Agency
FY	fiscal year
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
L&V	limitations and validation
MCL	maximum contaminant level
ND	nondetect
OU	operable unit
PBF	Power Burst Facility
RPD	relative percent difference
SAM	Sample and Analysis Management
SMCL	secondary maximum contaminant level
SPERT	Special Power Excursion Reactor Test
TIC	tentatively identified compound
VOC	volatile organic compound
WAG	waste area group



# **Annual Groundwater Monitoring Status Report for Waste Area Group 5 for Fiscal Year 2006**

## **1. INTRODUCTION**

Groundwater samples were collected in Fiscal Year (FY) 2006 from the Snake River Plain Aquifer beneath Waste Area Group (WAG) 5 at Idaho National Laboratory (INL). These samples were analyzed in accordance with requirements stated in the *Groundwater Monitoring Plan for the Waste Area Group 5 Remedial Action* (DOE-ID 2004). The FY 2006 sampling effort has been modified from previous sampling events based on recommendations made in the first five-year review (DOE-ID 2005), with concurrence from the U.S. Environmental Protection Agency (EPA) and Idaho Department of Environmental Quality (DEQ) (hereinafter referred to as the Agencies). This FY 2006 report is the sixth annual report since issuance of the *Record of Decision for the Power Burst Facility and Auxiliary Reactor Area* (DOE-ID 2000), which was signed in February 2000.

Waste Area Group 5 includes the Critical Infrastructure Test Range Complex (CITRC) (formerly the Power Burst Facility [PBF]) and the Auxiliary Reactor Area (ARA) in the southern part of INL (Figure 1). Groundwater monitoring is being conducted in partial satisfaction of requirements set forth in the final Record of Decision (DOE-ID 2000). As specified in the Record of Decision, groundwater monitoring was conducted annually until the first five-year review in FY 2005 to reduce the uncertainties associated with previous sampling efforts and to confirm that surface contaminants have not adversely affected the Snake River Plain Aquifer.

### **1.1 Purpose**

The purpose of this report is to present and summarize data regarding contaminant concentrations in the groundwater collected during FY 2006. The data presented here supplement the groundwater monitoring data presented in the *Waste Area Group 5 Operable Unit 5-12 Comprehensive Remedial Investigation/Feasibility Study* (DOE-ID 1999) and are a compilation of the data for the potential contaminants in the WAG 5 groundwater.

### **1.2 Groundwater Monitoring Requirements**

As outlined in the Groundwater Monitoring Plan (DOE-ID 2004), samples are to be collected from nine aquifer wells in the WAG 5 area (Figure 2). Samples are to be analyzed for volatile organic constituents and inorganic constituents identified in Section 2 of this report. Following the first five-year review (DOE-ID 2005), radionuclides and anions were dropped from the analyte list. The five-year review further recommended that inorganic and organic monitoring be discontinued in 2006 if monitoring results continue to show that inorganic contaminant concentrations have decreased to acceptable levels and organic contaminants are below concentrations of regulatory concern.

Water-level measurements were collected from 20 wells within and near WAG 5 in June 2005 prior to approval of the recommendation in the five-year review to discontinue water-level monitoring. Table 1 summarizes the construction details from each of the WAG 5 wells used to monitor groundwater and measure water levels.

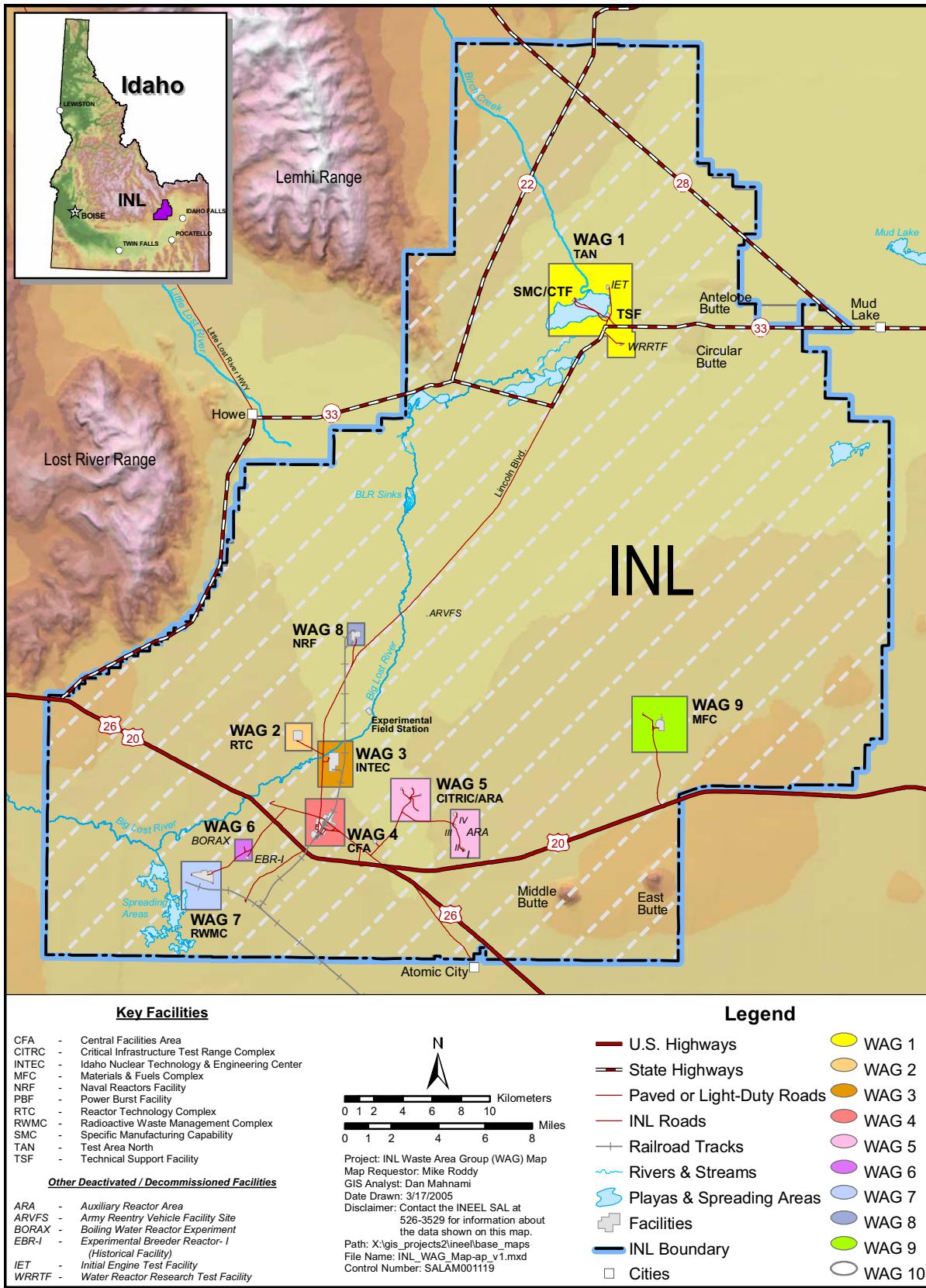


Figure 1. Idaho National Laboratory site map showing Waste Area Group locations.

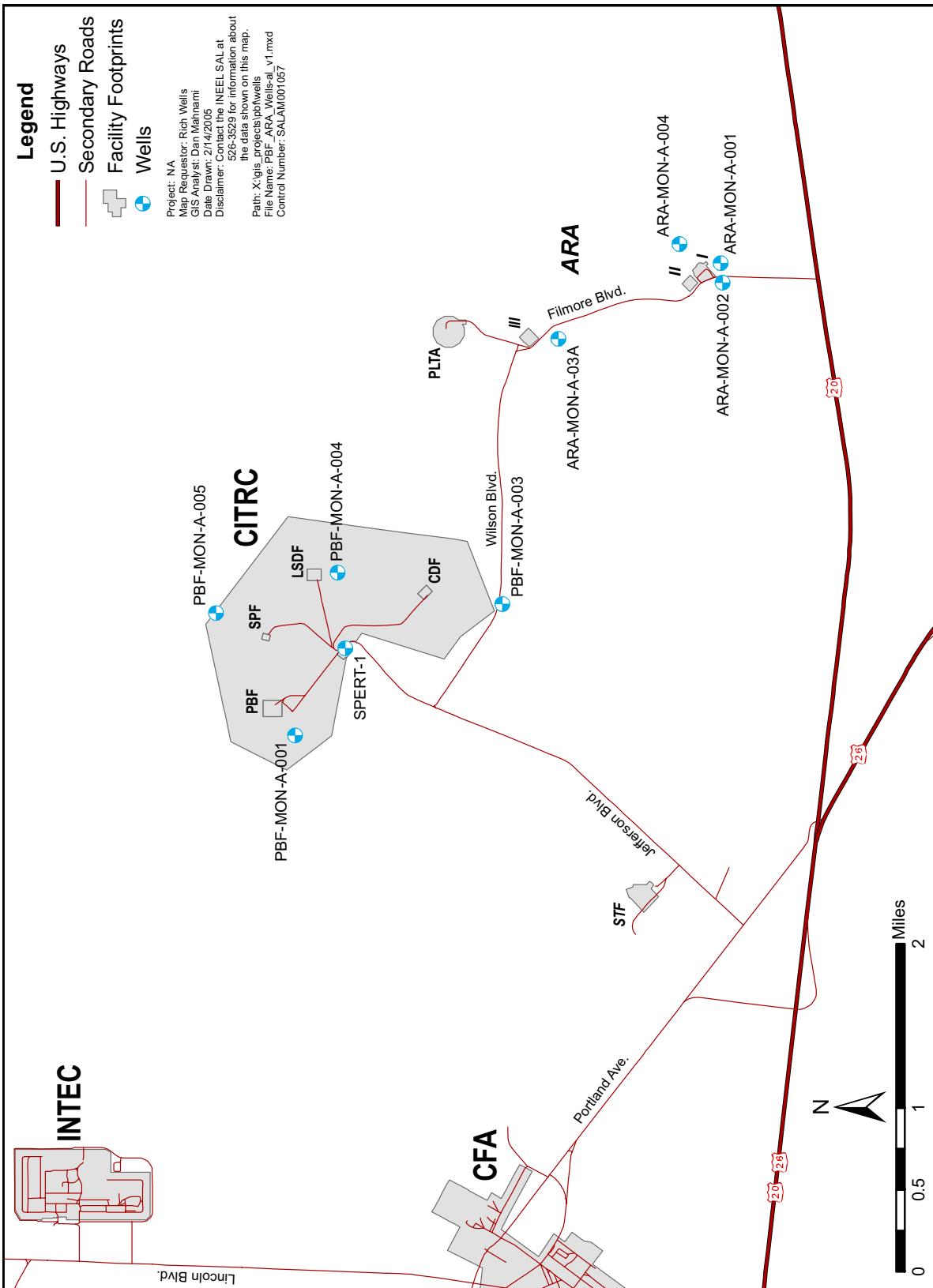


Figure 2. Location of wells sampled for Waste Area Group 5.

Table 1. Summary of well information for Waste Area Group 5 groundwater monitoring wells.

Well Name	Screened Interval(s) (ft bls)	Well Use
ARA-MON-A-001	620–640	Sample
ARA-MON-A-002	600–620	Sample
ARA-MON-A-03A	624–644	Sample
ARA-MON-A-004	625–645	Sample
PBF-MON-A-001	454–484	Sample
PBF-MON-A-003	545–575	Sample
PBF-MON-A-004	522–542	Sample
PBF-MON-A-005	516–536	Sample
SPERT-I	482–492 522–542 552–582 597–617 632–652	Sample
STF-MON-A-01A	538–558	Water level
STF-MON-A-02A	510–530	Water level
STF-MON-A-003	493–533	Water level
STF-MON-A-004	500–540	Water level
USGS-001	600–630	Water level
USGS-005	475–497	Water level
USGS-020	467–477 515–552	Water level
USGS-082	470–570 593–693	Water level
USGS-107	270–690	Water level
USGS-110	580–780	Water level
USGS-116	401–438 438–572	Water level
NPR-TEST	504–532	Water level
NTP-AREA 2	667–722 742–814 844–876	Water level

bls = below land surface

## 2. MONITORING RESULTS

In November-December 2005, three wells were sampled for volatile organics and eight wells were sampled for inorganics (nine metals). Well ARA-MON-A-002 could not be sampled because of equipment failure in the well. The samples were analyzed in accordance with established INL and EPA methods. All analytical results were validated to resident procedures established by the INL Sample and Analysis Management (SAM) Office. Water-level measurements collected in June 2005 for the WAG 5 area also are presented.

## 2.1 Groundwater Monitoring Results

A complete list of the data collected is presented in Appendix A, while the data quality objectives defined in the Groundwater Monitoring Plan (DOE-ID 2004) are discussed in Appendix B. The results from the FY 2006 sampling round are compared to maximum contaminant levels (MCLs), secondary maximum contaminant levels (SMCLs), or action levels in Table 2. No analyte was detected at a concentration above its MCL, SMCL, or EPA action level. In addition, Table 2 shows a comparison of results to background concentrations for the INL.

### 2.1.1 Volatile Organic Compound Results

The volatile organic compound (VOC) analyses were performed in accordance with EPA's SW-846, Method 8260B (EPA 1986). Sample results for VOCs were below the MCLs for all analytes. Trichloroethene was detected in one well at 0.16 µg/L, which is well below the MCL of 5 µg/L. Although VOC detections have occurred in WAG 5 groundwater samples, consistent VOC detections have not occurred.

Table 2. Waste Area Group 5 groundwater quality summary for Fiscal Year 2006.

Analyte (µg/L)	Background <sup>a</sup>	Maximum	Minimum	Number of Wells with Detections above Background	Number of Wells with Detections above MCL	MCL or SMCL
Inorganics						
Arsenic	2 to 3	2.3	ND	0	0	10
Barium	50 to 70	93.5	34.5	1	0	2,000
Chromium	2 to 3	26.4	8.4	8	0	100
Cadmium	<1	0.26	ND	0	0	5
Lead	1 to 5	11.6	ND	2	0	15 <sup>b</sup>
Mercury	<1	ND	ND	0	0	10
Selenium	2.5	1.7	ND	0	0	50
Silver	<1	ND	ND	0	0	100
Zinc	10.5 to 54	1120	ND	2	0	5,000 <sup>c</sup>
Organics						
Trichloroethene	— <sup>d</sup>	0.16	ND	1	0	5
a. Background concentrations are from Knobel, Orr, and Cecil (1992), except selenium and zinc, which are from USGS 1999.						
b. Concentration represents the EPA-defined action level for this contaminant.						
c. Concentration represents the EPA-defined secondary standard for this contaminant.						
d. Volatile organic compounds are considered to be absent from background. “—” = no data						
MCL = maximum contaminant level						
ND = not detected						
SMCL = secondary maximum contaminant level						

## 2.1.2 Inorganic Results

Inorganic analyses included metals. Metals were analyzed in accordance with procedures delineated in SW-846 (EPA 1986) and are listed in Appendix A. Specific metals requested included arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver, and zinc. All analytical results for metals were below MCLs, SMCLs, or action levels. Lead had been detected in previous sampling events at concentrations slightly above the EPA action level of 15 µg/L, but it was below the action level in all samples collected for FY 2006. Two wells, PBF-MON-A-001 and PBF-MON-A-005, showed an increase in lead concentration in the FY 2006 sampling event, but the values were below the action level for lead. Similarly, zinc was elevated above background in the same two wells noted for lead, but zinc concentrations were less than the secondary MCL for zinc in both PBF-MON-A-001 and PBF-MON-A-005. The drop in water-levels in these two wells may have contributed to increased lead and zinc concentrations due to the uptake of suspended sediments because the metals samples are unfiltered.

The cause of the previous elevated lead concentrations is believed to be the galvanized water-access and discharge pipes. Excluding the production well SPERT-I, each of the WAG 5 groundwater monitoring wells was installed with galvanized water-access and discharge pipes. As part of the INL routine well maintenance program, pumps were removed and maintained, and galvanized pipes were removed and replaced with stainless steel pipes in all WAG 5 wells except SPERT-I. Galvanized pipe removed from these wells showed evidence of corrosion and rusting.

Corrosion of galvanized pipes has been attributed to the presence of lead and zinc in groundwater samples from other wells at INL—specifically, wells in and around the Central Facilities Area and Test Area North. After galvanized pipe was replaced with stainless steel pipe in other INL wells, the concentrations of lead and zinc decreased. Similarly, upon replacement of galvanized pipe in the ARA/PBF wells, the lead concentrations decreased to background levels. Consequently, the elevated lead concentrations in the ARA/PBF wells were probably the result of corroded galvanized pipe in the wells.

Chromium was detected above background concentrations (Table 3). The natural chromium concentrations probably are higher in the vicinity of PBF and ARA because the upgradient well, PBF-MON-A-005, has concentrations similar to the other wells. The chromium concentrations are consistent with historical results (INEEL 2003; INEEL 2004; ICP 2005).

Table 3. Groundwater field-measured parameters for Waste Area Group 5 wells in Fiscal Year 2006.

Well Name	Date Sampled	Water Level (ft bgs) <sup>a</sup>	Temperature (°C)	pH	Specific Conductivity (mmhos/cm)	Dissolved Oxygen (mg/L)
PBF-MON-A-003	12/6/2005	523.43	12.91	7.91	0.354	6.07
ARA-MON-A-002	12/6/2005	602.31	b	b	b	b
ARA-MON-A-001	11/30/2005	596.47	13.91	7.86	0.369	6.65
SPERT-I	12/05/2005	NM	9.59	8.80	0.376	9.55
ARA-MON-A-03A	11/30/2005	610.19	13.48	7.82	0.385	6.15
ARA-MON-A-004	12/6/2005	624.5	14.28	7.68	0.371	6.07
PBF-MON-A-004	11/28/2005	503.92	11.64	7.91	0.368	8.59
PBF-MON-A-005	11/28/2005	516.69	10.89	7.76	0.346	8.36
PBF-MON-A-001	11/28/2005	449.82	10.32	8.61	0.363	2.61

a. Water level at the time of sampling.

b. No samples collected due to well equipment failure.

bgs = below ground surface

NM = not measured

### **2.1.3 Field-Measured Parameters**

Specific conductance, dissolved oxygen, pH, and temperature were measured in the field at the time of sampling. These parameters are summarized in Table 3. The dissolved oxygen readings indicate that oxidizing conditions exist in the aquifer. Specific conductance measurements were fairly uniform with a relatively tight range from 0.354 to 0.385 mmhos/cm, with the highest value in Well ARA-MON-A-03A. The pH values ranged from 7.68 to 8.8 with the highest pH values at PBF-MON-A-001 and SPERT-I. The higher pH value for PBF-MON-A-001 is similar to previous measurements, and this well typically has had a higher pH value than the other WAG 5 wells.

## **2.2 Groundwater Level Measurements**

The most recent complete round of water-level measurements for the WAG 5 area is from June 2005 (Table 4). These water-level measurements were collected before it was agreed upon in the five-year review to terminate water-level monitoring (DOE-ID 2005). The water-level data are presented here for completeness. The current ground elevation and borehole deviation correction factors are shown in Table 4. A water-level contour map prepared from these measurements is shown on Figure 3. Similar to past groundwater contour maps for WAG 5, the contour map of the June 2005 data shows steep contours in the CITRC area, with the direction of local groundwater gradients somewhat counter to the regional south-southwest gradient.

## **3. CONCLUSIONS AND RECOMMENDATIONS**

This section summarizes the conclusions and recommendations based on the groundwater monitoring events that have occurred to date.

### **3.1 Conclusions**

Groundwater monitoring for FY 2006 was completed in November–December 2005 in accordance with the WAG 5 Record of Decision (DOE-ID 2000), the Groundwater Monitoring Plan (DOE-ID 2004) and recommendations from the first 5-year review (DOE-ID 2005). As discussed in Appendix B, all data quality objectives defined in the groundwater monitoring plan were met. Overall, most analyte concentrations appear to be consistent with historical results and do not indicate the influence of contaminants from the surface of the ARA or CITRC areas.

All constituents analyzed from the groundwater samples collected during the FY 2006 sampling event were below MCLs. Lead concentrations, which have been above the action level for lead in several wells in the past, were all below the action level in FY 2006. The FY 2006 sampling event represents the fourth consecutive year that the lead concentrations have not exceeded the action level. Replacement of galvanized pipe with stainless steel pipe appears to have removed the source of the lead.

### **3.2 Recommendations**

The following recommendations follow the recommendations made in the five-year review for WAG 5 (DOE-ID 2005).

The groundwater contour map prepared from the water elevations measured during June 2005 continues to show a steep hydraulic gradient in the CITRC area and is consistent with previous contour maps of the area. The five-year review recommended discontinuing the water-level monitoring, and the data from June 2005 supports that recommendation.

Table 4. Water-level data from June 2005 for Waste Area Group 5 area wells.

Well Name	Sample Date	Land Surface Elevation (ft)	Stickup (ft)	Depth to Water from Measuring Point (ft)	Depth to Water (ft bbc)	E-line Correction (ft)	Deviation Correction (ft)	Water Level Elevation (ft amsl)
USGS-082	06/15/2005	4906.99	2.90	462.06	459.16	0.25	0.02	4447.60
USGS-020	06/15/2005	4916.36	2.05	473.04	470.99	0.26	0.07	4445.18
USGS-107	06/13/2005	4917.50	2.00	488.33	486.33	-0.04	0.00	4431.21
USGS-116	06/14/2005	4916.03	3.89	472.53	468.64	0.25	0.18	4447.31
USGS-110	06/13/2005	4999.84	2.45	573.63	571.18	-0.05	0.06	4428.77
STF-MON-A-003	06/13/2005	4937.01	2.74	507.81	505.07	0.28	0.14	4431.80
STF-MON-A-004	06/13/2005	4945.37	2.91	515.65	512.74	0.28	0.10	4432.45
STF-MON-A-01A	06/13/2005	4941.40	2.61	510.10	507.49	0.28	0.03	4433.66
STF-MON-A-02A	06/13/2005	4937.30	3.35	505.49	502.14	0.27	0.02	4434.91
NPR-TEST	06/14/2005	4933.15	3.41	476.05	472.64	0.04	0.00	4460.46
NTP-AREA 2	06/13/2005	5128.42	3.00	681.49	678.49	0.36	0.00	4449.57
USGS-001	06/13/2005	5022.71	1.41	596.10	594.69	-0.05	0.14	4428.21
USGS-005	06/14/2005	4937.79	2.71	480.12	477.41	0.04	0.00	4460.34
PBF-MON-A-001	06/30/2005	4906.15	2.38	453.87	451.49	0.25	0.02	4454.43
PBF-MON-A-003	06/13/2005	4959.29	2.20	525.49	523.29	0.29	0.06	4435.78
PBF-MON-A-004	06/14/2005	4939.66	3.38	503.46	500.08	0.27	0.06	4439.36
ARA-MON-A-001	06/13/2005	5034.30	3.08	599.23	596.15	0.32	0.47	4438.30
ARA-MON A-002	06/13/2005	5037.40	3.01	602.42	599.41	0.32	0.10	4437.77
ARA-MON A-03A	06/13/2005	5050.10	3.22	613.39	610.17	0.33	0.12	4439.72
ARA-MON-A-004	06/13/2005	5064.60	3.06	627.61	624.55	0.34	0.08	4439.79

amsl = above median sea level

bbc = below brass cap

bgs = below ground surface

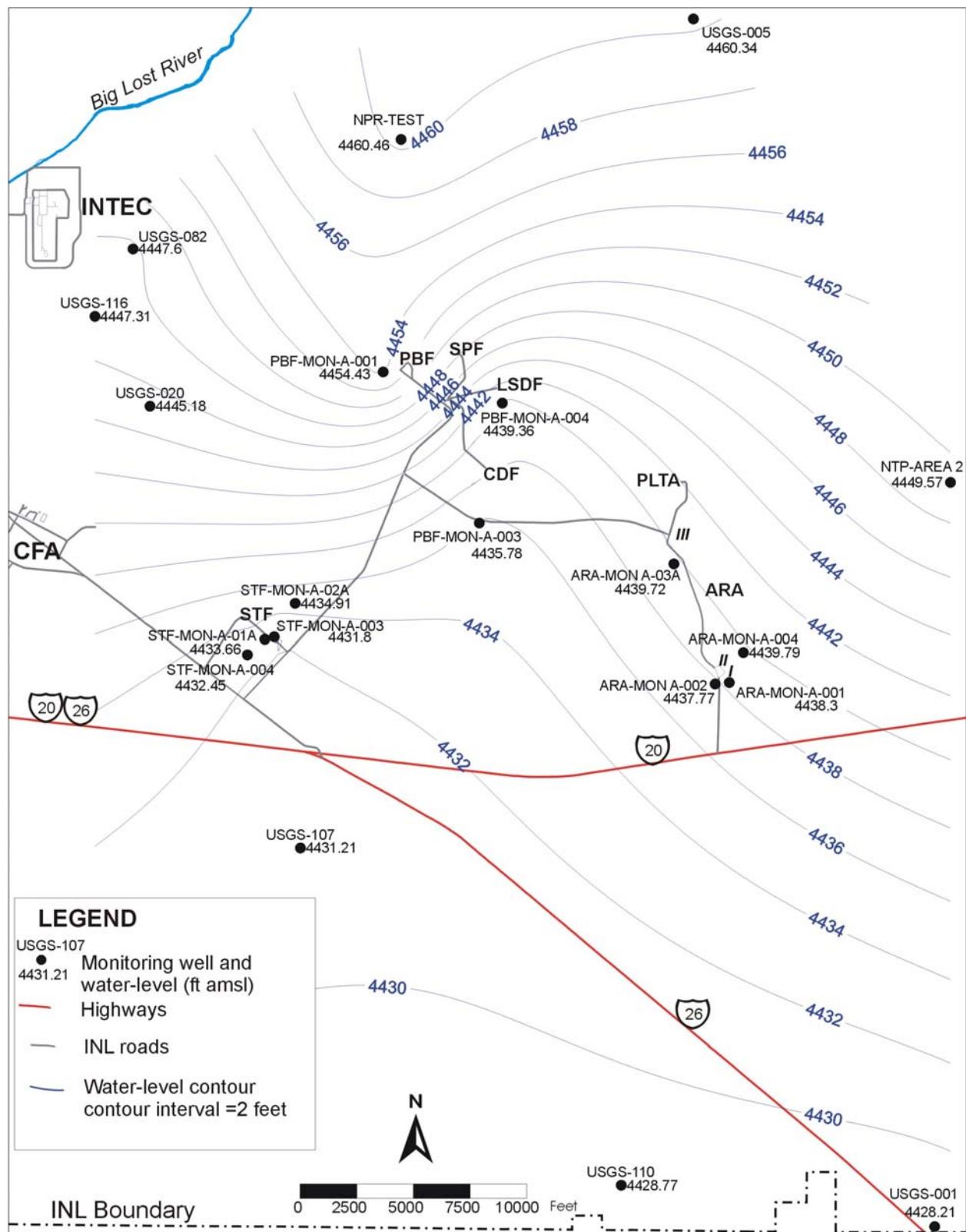


Figure 3. Waste Area Group 5 groundwater contour map of June 2005 data.

Concentrations of organic, inorganic, and radiological constituents are substantially below EPA-defined regulatory levels. It is recommended that if all organic and inorganic contaminants are below regulatory levels in the next sampling event, then groundwater monitoring should be discontinued.

#### **4. REFERENCES**

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- INEE, 2004, *Annual Groundwater Monitoring Status Report for the Waste Area Group 5 for Fiscal Year 2004*, ICP/EXT-04-00369, Rev. 1, Idaho National Engineering and Environmental Laboratory, November 2004.
- Knobel, L. L., B. R. Orr, and L. D. Cecil, 1992, "Summary of Background Concentrations of Selected Radiochemical and Chemical Constituents in Groundwater from the Snake River Plain Aquifer Idaho: Estimated from an Analysis of Previously Published Data," *Journal of Idaho Academy of Science*, Vol. 28, No. 1.
- USGS, 1999, *Chemical Constituents in Ground Water from 39 Selected Sites with an Evaluation of Associated Quality Assurance Data, Idaho National Engineering and Environmental Laboratory and vicinity, Idaho*, United States Geological Survey Open File Report 99-246, pp. 58.

## **Appendix A**

### **Analytical Results**



## Appendix A

### Analytical Results

This appendix presents the analytical data from the Waste Area Group 5 groundwater sampling. The analytes and analytical methods are summarized below in Table A-1. The analytical results are presented in Table A-2 and for convenience are provided on CD inside back cover of this report. In Table A-2, sample and duplicate samples are denoted by the number in front of the two letter analytical code at the end of the field sample number with a “1” referring to the sample and “2” referring to a duplicate. For example, 5GM02901VG and 5GM02902VG refer to the sample and duplicate, respectively, for volatile organic compounds at PBF-MON-A-001.

Table A-1. Analytes and method codes.

Compound	Method Code	Method Description
Arsenic	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Barium	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Cadmium	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Chromium	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Lead	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Selenium	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Silver	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Zinc	SW6020	Inductively Coupled Plasma - Mass Spectrometry
Mercury	SW7470A	Mercury in Liquid Waste (Manual Cold-vapor Technique)
VOCs	SW8260B	Volatile Organic Compounds by GC/MS

GC = gas chromatograph(y)

MS = mass spectrometry

Data qualifier flags used in this appendix are a consolidation of laboratory- and validation-assigned flags and are defined as follows:

#### Organics

- B – the analyte was detected in the associated laboratory blank.
- U – the analyte was not detected.
- UJ – the analyte was analyzed for, but it was not detected. The associated value is an estimate and might be inaccurate or imprecise.
- J – the analyte was detected, but the associated value is an estimate and might be inaccurate or imprecise.
- R – the accuracy of the data is so questionable that it is recommended that the data not be used. The “R” flag overrides all other applicable flags.

## Inorganics

- B – the result is less than the contract-required reporting limit but greater than or equal to the instrument detection limit.
- E – the post-digestion spike was outside control limits.
- N – the matrix spike recovery was outside control limits.
- U – the analyte was not detected.
- UJ – the analyte was analyzed for, but it was not detected. The associated value is an estimate and might be inaccurate or imprecise.
- R – the accuracy of the data is so questionable that it is recommended that the data not be used. The “R” flag overrides all other applicable flags.

Table A-2. Analytical results.

Field Sample Number	Location	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
5GM02501Z4	ARA-MON-1	Arsenic	2.3	B		UG/L	F	DNT-062-06
5GM02501Z4	ARA-MON-1	Barium	37.9			UG/L	F	DNT-062-06
5GM02501Z4	ARA-MON-1	Cadmium	0.067	U		UG/L	F	DNT-062-06
5GM02501Z4	ARA-MON-1	Chromium	10.2			UG/L	F	DNT-062-06
5GM02501Z4	ARA-MON-1	Lead	0.57	U		UG/L	F	DNT-062-06
5GM02501Z4	ARA-MON-1	Mercury	0.046	U		UG/L	F	DNT-062-06
5GM02501Z4	ARA-MON-1	Selenium	1.1	B		UG/L	F	DNT-062-06
5GM02501Z4	ARA-MON-1	Silver	1.5	U		UG/L	F	DNT-062-06
5GM02501Z4(RE)	ARA-MON-1	Zinc	4.1	BNE	UJ	UG/L	F	DNT-135-06
5GM02701Z4	ARA-MON-3A	Arsenic	1.8	U		UG/L	F	DNT-062-06
5GM02701Z4	ARA-MON-3A	Barium	46.1			UG/L	F	DNT-062-06
5GM02701Z4	ARA-MON-3A	Cadmium	0.067	U		UG/L	F	DNT-062-06
5GM02701Z4	ARA-MON-3A	Chromium	26.4			UG/L	F	DNT-062-06
5GM02701Z4	ARA-MON-3A	Lead	4.2			UG/L	F	DNT-062-06
5GM02701Z4	ARA-MON-3A	Mercury	0.046	U		UG/L	F	DNT-062-06
5GM02701Z4	ARA-MON-3A	Selenium	1.3	B		UG/L	F	DNT-062-06
5GM02701Z4	ARA-MON-3A	Silver	1.5	U		UG/L	F	DNT-062-06
5GM02701Z4(RE)	ARA-MON-3A	Zinc	22.9	NE	J	UG/L	F	DNT-135-06
5GM02801Z4	ARA-MON-4	Arsenic	1.8	U		UG/L	F	DNT-061.06
5GM02801Z4	ARA-MON-4	Barium	39.8			UG/L	F	DNT-061.06
5GM02801Z4	ARA-MON-4	Cadmium	0.067	U		UG/L	F	DNT-061.06
5GM02801Z4	ARA-MON-4	Chromium	9.4	B		UG/L	F	DNT-061.06
5GM02801Z4	ARA-MON-4	Lead	1.4	B		UG/L	F	DNT-061.06
5GM02801Z4	ARA-MON-4	Mercury	0.046	U		UG/L	F	DNT-061.06
5GM02801Z4	ARA-MON-4	Selenium	1.2	B		UG/L	F	DNT-061.06
5GM02801Z4	ARA-MON-4	Silver	1.5	U		UG/L	F	DNT-061.06
5GM02801Z4(RE)	ARA-MON-4	Zinc	26.3	NE	J	UG/L	F	DNT-135-06
5GM03501VG	EQUIPMNT RINSTE	1,1,2-Tetrachloroethane	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	1,1,1-Trichloroethane	1	U		UG/L	F	HCJ-009-06

Table A-2. (continued).

Field Sample Number	Location	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
5GM03501VG	EQUIPMNT RINSTE	1,1,2,2-Tetrachloroethane	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	1,1,2-Trichloroethane	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	1,1-Dichloroethane	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	1,1-Dichloroethene	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	1,2,3-Trichloropropane	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	1,2-Dibromo-3-chloropropane	5	U	R	UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	1,2-Dibromoethane	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	1,2-Dibromoethene	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	1,2-Dichloroethane	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	1,2-Dichloropropane	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	1,4-Dioxane	80	U	R	UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	2-Butanone	10	U	R	UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	2-Hexanone	5	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Acetone	10	U	UJ	UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Acetonitrile	20	U	R	UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Acrolein	5	U	R	UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Acrylonitrile	1	U	R	UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Allyl chloride	5	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Arsenic	1.8	U		UG/L	F	DNT-060-06
5GM03501VG	EQUIPMNT RINSTE	Barium	0.6	U		UG/L	F	DNT-060-06
5GM03501VG	EQUIPMNT RINSTE	Benzene	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Bromodichloromethane	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Bromoform	2	U	UJ	UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Bromomethane	0.88	JB	J	UG/L	F	HCJ-009-06
5GM03501Z4	EQUIPMNT RINSTE	Cadmium	0.067	U		UG/L	F	DNT-060-06
5GM03501Z4	EQUIPMNT RINSTE	Carbon disulfide	5	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Carbon tetrachloride	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Chlorobenzene	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Chloroethane	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Chloroform	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Chloromethane	0.41	JB	J	UG/L	F	HCJ-009-06

Table A-2. (continued).

Field Sample Number	Location	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
5GM03501VG	EQUIPMNT RINSTE	Chloroprene	5	U		UG/L	F	HCJ-009-06
5GM03501Z4	EQUIPMNT RINSTE	Chromium	3.7	U		UG/L	F	DNT-060-06
5GM03501VG	EQUIPMNT RINSTE	cis-1,2-Dichloroethene	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	cis-1,3-Dichloropropene	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Dibromochloromethane	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Dibromomethane	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Dichlorodifluoromethane	5	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Ethylbenzene	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Isobutyl alcohol	80	U	R	UG/L	F	HCJ-009-06
5GM03501Z4	EQUIPMNT RINSTE	Lead	0.57	U		UG/L	F	DNT-060-06
5GM03501Z4	EQUIPMNT RINSTE	Mercury	0.046	U		UG/L	F	DNT-060-06
5GM03501VG	EQUIPMNT RINSTE	Methacrylonitrile	5	U	R	UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Methyl iodide	2	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Methyl isobutyl ketone	5	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Methylene chloride	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Methylmethacrylate	1	U	R	UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Propionitrile	5	U	R	UG/L	F	HCJ-009-06
5GM03501Z4	EQUIPMNT RINSTE	Selenium	0.57	U		UG/L	F	DNT-060-06
5GM03501Z4	EQUIPMNT RINSTE	Silver	1.5	U		UG/L	F	DNT-060-06
5GM03501VG	EQUIPMNT RINSTE	Styrene	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Tetrachloroethene	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Toluene	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	trans-1,2-Dichloroethene	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	trans-1,3-Dichloropropene	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	trans-1,4-Dichloro-2-butene	5	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Trichloroethene	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Trichlorofluoromethane	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Vinyl acetate	2	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Vinyl chloride	1	U		UG/L	F	HCJ-009-06
5GM03501VG	EQUIPMNT RINSTE	Xylenes	3	U		UG/L	F	HCJ-009-06

Table A-2. (continued).

Field Sample Number	Location	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
5GM03501Z4(RE)	EQUIPMNT RINSTE	Zinc	2.3	BNE	UJ	UG/L	F	DNT-135-06
5GM03401VG	FIELD BLANK	1,1,1,2-Tetrachloroethane	1	U	UG/L	F	HCJ-008-06	
5GM03401VG	FIELD BLANK	1,1,1-Trichloroethane	1	U	UG/L	F	HCJ-008-06	
5GM03401VG	FIELD BLANK	1,1,2,2-Tetrachloroethane	1	U	UG/L	F	HCJ-008-06	
5GM03401VG	FIELD BLANK	1,1,2-Trichloroethane	1	U	UG/L	F	HCJ-008-06	
5GM03401VG	FIELD BLANK	1,1-Dichloroethane	1	U	UG/L	F	HCJ-008-06	
5GM03401VG	FIELD BLANK	1,1-Dichloroethene	1	U	UG/L	F	HCJ-008-06	
5GM03401VG	FIELD BLANK	1,2,3-Trichloropropane	1	U	UG/L	F	HCJ-008-06	
5GM03401VG	FIELD BLANK	1,2-Dibromo-3-chloropropane	5	U	R	UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	1,2-Dibromoethane	1	U	UG/L	F	HCJ-008-06	
5GM03401VG	FIELD BLANK	1,2-Dichloroethane	1	U	UG/L	F	HCJ-008-06	
5GM03401VG	FIELD BLANK	1,2-Dichloropropane	1	U	UG/L	F	HCJ-008-06	
5GM03401VG	FIELD BLANK	1,2-Dibromoethane	1	U	UG/L	F	HCJ-008-06	
5GM03401VG	FIELD BLANK	1,2-Dioxane	80	U	R	UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	2-Butanone	10	U	R	UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	2-Hexanone	5	U	J	UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Acetone	1.4	JB	J	UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Acetonitrile	20	U	R	UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Acrolein	5	U	R	UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Acrylonitrile	1	U	R	UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Allyl chloride	5	U	UG/L	F	HCJ-008-06	
5GM03401VG	FIELD BLANK	Arsenic	1.8	U	UG/L	F	DNT-062-06	
5GM03401VG	FIELD BLANK	Barium	0.6	U	UG/L	F	DNT-062-06	
5GM03401VG	FIELD BLANK	Benzene	1	U	UG/L	F	HCJ-008-06	
5GM03401Z4	FIELD BLANK	Bromodichloromethane	1	U	UG/L	F	HCJ-008-06	
5GM03401Z4	FIELD BLANK	Bromoform	2	U	UG/L	F	HCJ-008-06	
5GM03401VG	FIELD BLANK	Bromomethane	2.6	B	UJ	UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Cadmium	0.067	U	J	UG/L	F	DNT-062-06
5GM03401VG	FIELD BLANK	Carbon disulfide	5	U	UG/L	F	HCJ-008-06	
5GM03401VG	FIELD BLANK	Carbon tetrachloride	1	U	UG/L	F	HCJ-008-06	
5GM03401VG	FIELD BLANK	Chlorobenzene	1	U	UG/L	F	HCJ-008-06	

Table A-2. (continued).

Field Sample Number	Location	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
5GM03401VG	FIELD BLANK	Chloroethane	1	U		UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Chloroform	0.19	J		UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Chloromethane	1.2	JB	J	UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Chloroprene	5	U		UG/L	F	HCJ-008-06
5GM03401Z4	FIELD BLANK	Chromium	5.1	B		UG/L	F	DNT-062-06
5GM03401VG	FIELD BLANK	cis-1,2-Dichloroethene	1	U		UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	cis-1,3-Dichloropropene	1	U		UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Dibromochloromethane	1	U		UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Dibromomethane	1	U		UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Dichlorodifluoromethane	5	U		UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Ethylbenzene	1	U		UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Isobutyl alcohol	80	U	R	UG/L	F	HCJ-008-06
5GM03401Z4	FIELD BLANK	Lead	0.57	U		UG/L	F	DNT-062-06
5GM03401Z4	FIELD BLANK	Mercury	0.046	U		UG/L	F	DNT-062-06
5GM03401VG	FIELD BLANK	Methacrylonitrile	5	U	R	UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Methyl iodide	2	U		UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Methyl isobutyl ketone	5	U		UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Methylene Chloride	1	U		UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Methylmethacrylate	1	U	R	UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Propionitrile	5	U	R	UG/L	F	HCJ-008-06
5GM03401Z4	FIELD BLANK	Selenium	0.57	U		UG/L	F	DNT-062-06
5GM03401Z4	FIELD BLANK	Silver	1.5	U		UG/L	F	DNT-062-06
5GM03401VG	FIELD BLANK	Styrene	1	U		UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Tetrachloroethene	1	U		UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Toluene	1	U		UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	trans-1,2-Dichloroethene	1	U		UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	trans-1,3-Dichloropropene	1	U	UJ	UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	trans-1,4-Dichloro-2-butene	5	U		UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Trichloroethene	1	U		UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Trichlorofluoromethane	1	U		UG/L	F	HCJ-008-06

Table A-2. (continued).

Field Sample Number	Location	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
5GM03401VG	FIELD BLANK	Vinyl acetate	2	U		UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Vinyl chloride	1	U		UG/L	F	HCJ-008-06
5GM03401VG	FIELD BLANK	Xylenes	3	U		UG/L	F	HCJ-008-06
5GM03401Z4(RE)	FIELD BLANK	Zinc	3.5	BNE	UJ	UG/L	F	DNT-135-06
5GM02901VG	PBF-MON-1	1,1,1,2-Tetrachloroethane	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	1,1,1,2-Tetrachloroethane	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	1,1,1-Trichloroethane	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	1,1,1-Trichloroethane	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	1,1,2,2-Tetrachloroethane	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	1,1,2,2-Tetrachloroethane	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	1,1,2-Trichloroethane	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	1,1,2-Trichloroethane	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	1,1-Dichloroethane	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	1,1-Dichloroethane	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	1,1-Dichloroethene	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	1,1-Dichloroethene	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	1,2,3-Trichloropropane	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	1,2,3-Trichloropropane	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	1,2-Dibromo-3-chloropropane	5	U	R	UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	1,2-Dibromo-3-chloropropane	5	U	R	UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	1,2-Dibromoethane	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	1,2-Dibromoethane	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	1,2-Dichloroethane	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	1,2-Dichloroethane	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	1,2-Dichloropropane	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	1,2-Dichloropropane	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	1,4-Dioxane	80	U	R	UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	1,4-Dioxane	80	U	R	UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	2-Butanone	10	U	R	UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	2-Butanone	10	U	R	UG/L	F	HCJ-008-06

Table A-2. (continued).

Field Sample Number	Location	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
5GM02901VG	PBF-MON-1	2-Hexanone	5	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	2-Hexanone	5	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Acetone	10	U	UJ	UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Acetone	10	U	UJ	UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Acetonitrile	20	U	R	UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Acetonitrile	20	U	R	UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Acrolein	5	U	R	UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Acrolein	5	U	R	UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Acrylonitrile	1	U	R	UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Acrylonitrile	1	U	R	UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Allyl chloride	5	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Allyl chloride	5	U		UG/L	F	HCJ-008-06
5GM02901Z4	PBF-MON-1	Arsenic	1.8	U		UG/L	F	DNT-062-06
5GM02902Z4	PBF-MON-1	Arsenic	1.8	U		UG/L	F	DNT-062-06
5GM02901Z4	PBF-MON-1	Barium	46.5			UG/L	F	DNT-062-06
5GM02902Z4	PBF-MON-1	Barium	53			UG/L	F	DNT-062-06
5GM02901VG	PBF-MON-1	Benzene	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Benzene	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Bromodichloromethane	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Bromodichloromethane	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Bromoform	2	U	UJ	UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Bromoform	2	U	UJ	UG/L	F	HCJ-008-06
5GM02901Z4	PBF-MON-1	Bromomethane	5	U		UG/L	F	DNT-062-06
5GM02902VG	PBF-MON-1	Bromomethane	5	U		UG/L	F	DNT-062-06
5GM02901Z4	PBF-MON-1	Cadmium	0.25			UG/L	F	HCJ-008-06
5GM02902Z4	PBF-MON-1	Cadmium	0.26			UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Carbon disulfide	5	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Carbon disulfide	5	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Carbon tetrachloride	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Carbon tetrachloride	1	U		UG/L	F	HCJ-008-06

Table A-2. (continued).

Field Sample Number	Location	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
5GM02901VG	PBF-MON-1	Chlorobenzene	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Chlorobenzene	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Chloroethane	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Chloroethane	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Chloroform	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Chloroform	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Chloromethane	5	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Chloromethane	5	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Chloroprene	5	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Chloroprene	5	U		UG/L	F	HCJ-008-06
5GM02901Z4	PBF-MON-1	Chromium	10.3			UG/L	F	DNT-062-06
5GM02902Z4	PBF-MON-1	Chromium	16.1			UG/L	F	DNT-062-06
5GM02901VG	PBF-MON-1	cis-1,2-Dichloroethene	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	cis-1,2-Dichloroethene	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	cis-1,3-Dichloropropene	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	cis-1,3-Dichloropropene	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	cis-1,3-Dichloropropene	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Dibromochloromethane	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Dibromochloromethane	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Dibromomethane	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Dibromomethane	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Dichlorodifluoromethane	5	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Dichlorodifluoromethane	5	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Ethylbenzene	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Ethylbenzene	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Isobutyl alcohol	80	U	R	UG/L	F	HCJ-008-06
5GM02901Z4	PBF-MON-1	Isobutyl alcohol	80	U	R	UG/L	F	DNT-062-06
5GM02902Z4	PBF-MON-1	Lead	7.2			UG/L	F	DNT-062-06
5GM02901VG	PBF-MON-1	Lead	7.6			UG/L	F	DNT-062-06
5GM02902VG	PBF-MON-1	Mercury	0.046	U		UG/L	F	DNT-062-06
5GM02902Z4	PBF-MON-1	Mercury	0.046	U		UG/L	F	DNT-062-06

Table A-2. (continued).

Field Sample Number	Location	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
5GM02901VG	PBF-MON-1	Methacrylonitrile	5	U	R	UG/L	F	Hcj-008-06
5GM02902VG	PBF-MON-1	Methacrylonitrile	5	U	R	UG/L	F	Hcj-008-06
5GM02901VG	PBF-MON-1	Methyl iodide	2	U		UG/L	F	Hcj-008-06
5GM02902VG	PBF-MON-1	Methyl iodide	2	U		UG/L	F	Hcj-008-06
5GM02901VG	PBF-MON-1	Methyl isobutyl ketone	5	U		UG/L	F	Hcj-008-06
5GM02902VG	PBF-MON-1	Methyl isobutyl ketone	5	U		UG/L	F	Hcj-008-06
5GM02901VG	PBF-MON-1	Methylene chloride	1	U		UG/L	F	Hcj-008-06
5GM02902VG	PBF-MON-1	Methylene chloride	1	U		UG/L	F	Hcj-008-06
5GM02901VG	PBF-MON-1	Methylmethacrylate	1	U	R	UG/L	F	Hcj-008-06
5GM02902VG	PBF-MON-1	Methylmethacrylate	1	U	R	UG/L	F	Hcj-008-06
5GM02901VG	PBF-MON-1	Propionitrile	5	U	R	UG/L	F	Hcj-008-06
5GM02902VG	PBF-MON-1	Propionitrile	5	U	R	UG/L	F	Hcj-008-06
5GM02901Z4	PBF-MON-1	Selenium	1.1	B		UG/L	F	DNT-062-06
5GM02902Z4	PBF-MON-1	Selenium	0.57	U		UG/L	F	DNT-062-06
5GM02901Z4	PBF-MON-1	Silver	1.5	U		UG/L	F	DNT-062-06
5GM02902Z4	PBF-MON-1	Silver	1.5	U		UG/L	F	DNT-062-06
5GM02901VG	PBF-MON-1	Styrene	1	U		UG/L	F	Hcj-008-06
5GM02902VG	PBF-MON-1	Styrene	1	U		UG/L	F	Hcj-008-06
5GM02901VG	PBF-MON-1	Tetrachloroethene	1	U		UG/L	F	Hcj-008-06
5GM02902VG	PBF-MON-1	Tetrachloroethene	1	U		UG/L	F	Hcj-008-06
5GM02901VG	PBF-MON-1	Toluene	1	U		UG/L	F	Hcj-008-06
5GM02902VG	PBF-MON-1	Toluene	1	U		UG/L	F	Hcj-008-06
5GM02901VG	PBF-MON-1	trans-1,2-Dichloroethene	1	U		UG/L	F	Hcj-008-06
5GM02902VG	PBF-MON-1	trans-1,2-Dichloroethene	1	U		UG/L	F	Hcj-008-06
5GM02901VG	PBF-MON-1	trans-1,3-Dichloropropene	1	U		UG/L	F	Hcj-008-06
5GM02902VG	PBF-MON-1	trans-1,3-Dichloropropene	1	U		UG/L	F	Hcj-008-06
5GM02901VG	PBF-MON-1	trans-1,4-Dichloro-2-butene	5	U		UG/L	F	Hcj-008-06
5GM02902VG	PBF-MON-1	trans-1,4-Dichloro-2-butene	5	U		UG/L	F	Hcj-008-06
5GM02901VG	PBF-MON-1	Trichloroethene	0.16	J	J	UG/L	F	Hcj-008-06
5GM02902VG	PBF-MON-1	Trichloroethene	1	U		UG/L	F	Hcj-008-06

Table A-2. (continued).

Field Sample Number	Location	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
5GM02901VG	PBF-MON-1	Trichlorofluoromethane	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Trichlorofluoromethane	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Vinyl acetate	2	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Vinyl acetate	2	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Vinyl chloride	1	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Vinyl chloride	1	U		UG/L	F	HCJ-008-06
5GM02901VG	PBF-MON-1	Xylenes	3	U		UG/L	F	HCJ-008-06
5GM02902VG	PBF-MON-1	Xylenes	3	U		UG/L	F	HCJ-008-06
5GM02902Z4(RE)	PBF-MON-1	Zinc	1120	NE	J	UG/L	F	DNT-135-06
5GM02901Z4(RE)	PBF-MON-1	Zinc	1100	NE	J	UG/L	F	DNT-135-06
5GM03001VG	PBF-MON-3	1,1,1,2-Tetrachloroethane	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	1,1,1-Trichloroethane	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	1,1,2,2-Tetrachloroethane	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	1,1,2-Trichloroethane	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	1,1-Dichloroethane	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	1,1-Dichloroethene	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	1,2,3-Trichloropropane	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	1,2-Dibromo-3-chloropropane	5	U	R	UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	1,2-Dibromoethane	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	1,2-Dichloroethane	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	1,2-Dibromoethane	80	U	R	UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	2-Butanone	10	U	R	UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	2-Hexanone	5	U	R	UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Acetone	10	U	UJ	UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Acetonitrile	20	U	R	UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Acrolein	5	U	R	UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Acrylonitrile	1	U	R	UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Allyl chloride	5	U		UG/L	F	HCJ-009-06
5GM03001Z4	PBF-MON-3	Arsenic	1.8	U		UG/L	F	DNT-061.06

Table A-2. (continued).

Field Sample Number	Location	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
5GM03001Z4	PBF-MON-3	Barium	54.1	U		UG/L	F	DNT-061.06
5GM03001VG	PBF-MON-3	Benzene	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Bromodichloromethane	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Bromoform	2	U		UG/L	F	HCJ-009-06
5GM03001VG(1)	PBF-MON-3	Bromomethane	1	U		UG/L	F	HCJ-009-06
5GM03001Z4	PBF-MON-3	Cadmium	0.067	U		UG/L	F	DNT-061.06
5GM03001VG	PBF-MON-3	Carbon disulfide	5	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Carbon tetrachloride	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Chlorobenzene	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Chloroethane	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Chloroform	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Chloromethane	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Chloroprene	5	U		UG/L	F	HCJ-009-06
5GM03001Z4	PBF-MON-3	Chromium	9.5	B		UG/L	F	DNT-061.06
5GM03001VG	PBF-MON-3	cis-1,2-Dichloroethene	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	cis-1,3-Dichloropropene	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Dibromochloromethane	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Dibromomethane	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Dichlorodifluoromethane	5	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Ethylbenzene	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Isobutyl alcohol	80	U	R	UG/L	F	HCJ-009-06
5GM03001Z4	PBF-MON-3	Lead	0.57	U		UG/L	F	DNT-061.06
5GM03001Z4	PBF-MON-3	Mercury	0.046	U		UG/L	F	DNT-061.06
5GM03001VG	PBF-MON-3	Methacrylonitrile	5	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Methyl iodide	2	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Methyl isobutyl ketone	5	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Methylene chloride	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Methylmethacrylate	1	U	R	UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Propionitrile	5	U	R	UG/L	F	HCJ-009-06
5GM03001Z4	PBF-MON-3	Selenium	1.7	B		UG/L	F	DNT-061.06

Table A-2. (continued).

Field Sample Number	Location	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
5GM03001Z4	PBF-MON-3	Silver	1.5	U		UG/L	F	DNT-061.06
5GM03001VG	PBF-MON-3	Styrene	1	U	NJ	UG/L	F	HCJ-009-06
5GM03001VG(1)	PBF-MON-3	Sulfur Dioxide	1.3			UG/L	T	
5GM03001VG	PBF-MON-3	Tetrachloroethene	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Toluene	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	trans-1,2-Dichloroethene	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	trans-1,3-Dichloropropene	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	trans-1,4-Dichloro-2-butene	5	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Trichloroethene	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Trichlorofluoromethane	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Vinyl acetate	2	U	R	UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Vinyl chloride	1	U		UG/L	F	HCJ-009-06
5GM03001VG	PBF-MON-3	Xylenes	3	U		UG/L	F	HCJ-009-06
5GM03001Z4(RE)	PBF-MON-3	Zinc	1.7	BNE	UJ	UG/L	F	DNT-135-06
5GM03201Z4	PBF-MON-4	Arsenic	1.8	U		UG/L	F	DNT-062-06
5GM03201Z4	PBF-MON-4	Barium	34.5			UG/L	F	DNT-062-06
5GM03201Z4	PBF-MON-4	Cadmium	0.067	U		UG/L	F	DNT-062-06
5GM03201Z4	PBF-MON-4	Chromium	14.6			UG/L	F	DNT-062-06
5GM03201Z4	PBF-MON-4	Lead	0.57	U		UG/L	F	DNT-062-06
5GM03201Z4	PBF-MON-4	Mercury	0.046	U		UG/L	F	DNT-062-06
5GM03201Z4	PBF-MON-4	Selenium	1.4	B		UG/L	F	DNT-062-06
5GM03201Z4	PBF-MON-4	Silver	1.5	U		UG/L	F	DNT-062-06
5GM03201Z4	PBF-MON-4	Zinc	20.9	NE	J	UG/L	F	DNT-135-06
5GM03301Z4	PBF-MON-5	Arsenic	1.8	U		UG/L	F	DNT-062-06
5GM03301Z4	PBF-MON-5	Barium	93.5			UG/L	F	DNT-062-06
5GM03301Z4	PBF-MON-5	Cadmium	0.12	B		UG/L	F	DNT-062-06
5GM03301Z4	PBF-MON-5	Chromium	25.6			UG/L	F	DNT-062-06
5GM03301Z4	PBF-MON-5	Lead	11.6			UG/L	F	DNT-062-06
5GM03301Z4	PBF-MON-5	Mercury	0.046	U		UG/L	F	DNT-062-06
5GM03301Z4	PBF-MON-5	Selenium	1.6	B		UG/L	F	DNT-062-06

Table A-2. (continued).

Field Sample Number	Location	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
5GM03301Z4	PBF-MON-5	Silver	1.5	U	UG/L	F	DNT-062-06	
5GM03301Z4(RE)	PBF-MON-5	Zinc	642	NE	J	UG/L	F	DNT-135-06
5GM03101Z4(RE)	SPERT-I	Zinc	5.3	NE	UJ	UG/L	F	DNT-135-06
5GM03101VG	SPERT-I	1,1,1,2-Tetrachloroethane	1	U	UG/L	F	HCJ-009-06	
5GM03101VG	SPERT-I	1,1,1-Trichloroethane	1	U	UG/L	F	HCJ-009-06	
5GM03101VG	SPERT-I	1,1,2,2-Tetrachloroethane	1	U	UG/L	F	HCJ-009-06	
5GM03101VG	SPERT-I	1,1,2-Trichloroethane	1	U	UG/L	F	HCJ-009-06	
5GM03101VG	SPERT-I	1,1-Dichloroethane	1	U	UG/L	F	HCJ-009-06	
5GM03101VG	SPERT-I	1,1-Dichloroethene	1	U	UG/L	F	HCJ-009-06	
5GM03101VG	SPERT-I	1,2,3-Trichloropropane	1	U	UG/L	F	HCJ-009-06	
5GM03101VG	SPERT-I	1,2-Dibromo-3-chloropropane	5	U	UG/L	F	HCJ-009-06	
5GM03101VG	SPERT-I	1,2-Dibromoethane	1	U	UG/L	F	HCJ-009-06	
5GM03101VG	SPERT-I	1,2-Dichloroethane	1	U	UG/L	F	HCJ-009-06	
5GM03101VG	SPERT-I	1,2-Dichloropropane	1	U	UG/L	F	HCJ-009-06	
5GM03101VG	SPERT-I	1,4-Dioxane	80	U	R	UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	2-Butanone	10	U	R	UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	2-Hexanone	5	U	UG/L	F	HCJ-009-06	
5GM03101VG	SPERT-I	Acetone	10	U	UG/L	F	HCJ-009-06	
5GM03101VG	SPERT-I	Acetonitrile	20	U	R	UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Acrolein	5	U	R	UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Acrylonitrile	1	U	R	UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Allyl chloride	5	U	R	UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Arsenic	1.8	U	UG/L	F	DNT-060-06	
5GM03101VG	SPERT-I	Barium	56.1	U	UG/L	F	DNT-060-06	
5GM03101VG	SPERT-I	Benzene	1	U	UG/L	F	HCJ-009-06	
5GM03101Z4	SPERT-I	Bromodichloromethane	1	U	UG/L	F	HCJ-009-06	
5GM03101Z4	SPERT-I	Bromoform	2	U	UG/L	F	HCJ-009-06	
5GM03101VG	SPERT-I	Bromomethane	1	U	UG/L	F	HCJ-009-06	
5GM03101Z4	SPERT-I	Cadmium	0.067	U	UG/L	F	DNT-060-06	
5GM03101VG	SPERT-I	Carbon disulfide	5	U	UG/L	F	HCJ-009-06	

Table A-2. (continued).

Field Sample Number	Location	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
5GM03101VG	SPERT-I	Carbon tetrachloride	1	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Chlorobenzene	1	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Chloroethane	1	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Chloroform	1	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Chloromethane	1	U		UG/L	F	HCJ-009-06
5GM03101Z4	SPERT-I	Chloroprene	5	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Chromium	8.4	B		UG/L	F	DNT-060-06
5GM03101VG	SPERT-I	cis-1,2-Dichloroethene	1	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	cis-1,3-Dichloropropene	1	U	UJ	UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Dibromochloromethane	1	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Dibromomethane	1	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Dichlorodifluoromethane	5	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Ethylbenzene	1	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Isobutyl alcohol	80	U	R	UG/L	F	HCJ-009-06
5GM03101Z4	SPERT-I	Lead	0.57	U		UG/L	F	DNT-060-06
5GM03101Z4	SPERT-I	Mercury	0.046	U	R	UG/L	F	DNT-060-06
5GM03101VG	SPERT-I	Methacrylonitrile	5	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Methyl iodide	2	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Methyl isobutyl ketone	5	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Methylene chloride	1	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Methylmethacrylate	1	U	R	UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Propionitrile	5	U	R	UG/L	F	HCJ-009-06
5GM03101Z4	SPERT-I	Selenium	1.3	B		UG/L	F	DNT-060-06
5GM03101Z4	SPERT-I	Silver	1.5	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Styrene	1	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Tetrachloroethene	1	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Toluene	1	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	trans-1,2-Dichloroethene	1	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	trans-1,3-Dichloropropene	1	U	UJ	UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	trans-1,4-Dichloro-2-butene	5	U		UG/L	F	HCJ-009-06

Table A-2. (continued).

Field Sample Number	Location	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
5GM03101VG	SPERT-I	Trichloroethene	1	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Trichlorofluoromethane	1	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Vinyl acetate	2	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Vinyl chloride	1	U		UG/L	F	HCJ-009-06
5GM03101VG	SPERT-I	Xylenes	3	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	1,1,1,2-Tetrachloroethane	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	1,1,1,2-Tetrachloroethane	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	1,1,1-Trichloroethane	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	1,1,1-Trichloroethane	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	1,1,2,2-Tetrachloroethane	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	1,1,2,2-Tetrachloroethane	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	1,1,2-Trichloroethane	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	1,1,2-Trichloroethane	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	1,1-Dichloroethane	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	1,1-Dichloroethane	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	1,1-Dichloroethene	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	1,1-Dichloroethene	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	1,2,3-Trichloropropane	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	1,2,3-Trichloropropane	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	1,2-Dibromo-3-chloropropane	5	U	R	UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	1,2-Dibromo-3-chloropropane	5	U	R	UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	1,2-Dibromoethane	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	1,2-Dibromoethane	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	1,2-Dichloroethane	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	1,2-Dichloroethane	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	1,2-Dichloropropane	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	1,2-Dichloropropane	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	1,4-Dioxane	80	U	R	UG/L	F	HCJ-009-06
5GM03701VG	TRIP BLANK	1,4-Dioxane	80	U	R	UG/L	F	HCJ-008-06
5GM03601VG	TRIP BLANK	2-Butanone	10	U	R	UG/L	F	HCJ-008-06

Table A-2. (continued).

Field Sample Number	Location	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
5GM03701VG	TRIP BLANK	2-Butanone	10	U	R	UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	2-Hexanone	5	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	2-Hexanone	5	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Acetone	1.4	JB	J	UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Acetone	10	U	UJ	UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Acetonitrile	20	U	R	UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Acetonitrile	20	U	R	UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Acrolein	5	U	R	UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Acrolein	5	U	R	UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Acrylonitrile	1	U	R	UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Acrylonitrile	1	U	R	UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Allyl chloride	5	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Allyl chloride	5	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Benzene	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Benzene	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Bromodichloromethane	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Bromodichloromethane	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Bromoform	2	U	UJ	UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Bromoform	2	U	UJ	UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Bromomethane	1.2	B	J	UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Bromomethane	0.83	JB	J	UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Carbon disulfide	5	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Carbon disulfide	5	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Carbon tetrachloride	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Carbon tetrachloride	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Chlorobenzene	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Chlorobenzene	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Chloroethane	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Chloroethane	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Chloroform	1	U		UG/L	F	HCJ-008-06

Table A-2. (continued).

Field Sample Number	Location	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
5GM03701VG	TRIP BLANK	Chloroform	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Chloromethane	0.55	JB	J	UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Chloromethane	0.34	JB	J	UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Chloroprene	5	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Chloroprene	5	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	cis-1,2-Dichloroethene	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	cis-1,2-Dichloroethene	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	cis-1,3-Dichloropropene	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	cis-1,3-Dichloropropene	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Dibromochloromethane	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Dibromochloromethane	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Dibromomethane	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Dibromomethane	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Dibromomethane	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Dichlorodifluoromethane	5	U		UG/L	F	HCJ-008-06
5GM03601VG	TRIP BLANK	Dichlorodifluoromethane	5	U		UG/L	F	HCJ-009-06
5GM03701VG	TRIP BLANK	Ethylbenzene	1	U		UG/L	F	HCJ-008-06
5GM03601VG	TRIP BLANK	Ethylbenzene	1	U		UG/L	F	HCJ-009-06
5GM03701VG	TRIP BLANK	Isobutyl alcohol	80	U	R	UG/L	F	HCJ-008-06
5GM03601VG	TRIP BLANK	Isobutyl alcohol	80	U	R	UG/L	F	HCJ-009-06
5GM03701VG	TRIP BLANK	Methacrylonitrile	5	U	R	UG/L	F	HCJ-008-06
5GM03601VG	TRIP BLANK	Methacrylonitrile	5	U	R	UG/L	F	HCJ-009-06
5GM03701VG	TRIP BLANK	Methyl iodide	2	U		UG/L	F	HCJ-008-06
5GM03601VG	TRIP BLANK	Methyl iodide	2	U		UG/L	F	HCJ-009-06
5GM03701VG	TRIP BLANK	Methyl isobutyl ketone	5	U		UG/L	F	HCJ-008-06
5GM03601VG	TRIP BLANK	Methyl isobutyl ketone	5	U		UG/L	F	HCJ-009-06
5GM03701VG	TRIP BLANK	Methylene chloride	1	U		UG/L	F	HCJ-008-06
5GM03601VG	TRIP BLANK	Methylene chloride	1	U		UG/L	F	HCJ-009-06
5GM03701VG	TRIP BLANK	Methylmethacrylate	1	U	R	UG/L	F	HCJ-008-06
5GM03601VG	TRIP BLANK	Methylmethacrylate	1	U	R	UG/L	F	HCJ-009-06
5GM03701VG	TRIP BLANK	Propionitrile	5	U	R	UG/L	F	HCJ-008-06

Table A-2. (continued).

Field Sample Number	Location	Compound	Sample Result	Result Qualifier	Validation Flag	Sample Units	Organic TIC	L&V Report Number
5GM03701VG	TRIP BLANK	Propionitrile	5	U	R	UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Styrene	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Styrene	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Tetrachloroethene	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Tetrachloroethene	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Toluene	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Toluene	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	trans-1,2-Dichloroethene	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	trans-1,2-Dichloroethene	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	trans-1,3-Dichloropropene	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	trans-1,3-Dichloropropene	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	trans-1,4-Dichloro-2-butene	5	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	trans-1,4-Dichloro-2-butene	5	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Trichloroethene	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Trichloroethene	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Trichlorofluoromethane	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Trichlorofluoromethane	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Vinyl acetate	2	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Vinyl acetate	2	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Vinyl chloride	1	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Vinyl chloride	1	U		UG/L	F	HCJ-009-06
5GM03601VG	TRIP BLANK	Xylenes	3	U		UG/L	F	HCJ-008-06
5GM03701VG	TRIP BLANK	Xylenes	3	U		UG/L	F	HCJ-009-06

L&amp;V = limitations and validation

TIC = tentatively identified compound

**Appendix B**

**Quality Assurance/Quality Control  
Sample Results**



## Appendix B

# Quality Assurance/Quality Control Sample Results

### B-1. QUALITY ASSURANCE/QUALITY CONTROL SAMPLING

The purpose of collecting and analyzing quality assurance/quality control samples is to confirm the achievement of project objectives and data quality objectives. The overall objectives associated with the Waste Area Group 5 annual groundwater monitoring are discussed in the *Groundwater Monitoring Plan for the Waste Area Group 5 Remedial Action* (DOE-ID 2004). The overall objectives and quality assurance or quality control sample results for the Fiscal Year (FY) 2006 sampling effort are discussed in the following subsections.

#### B-1.1 Precision and Accuracy

The spatial variations in the concentrations of contaminants at individual sites create sampling variability. Additional variability, called measurement error, occurs during sample collection, handling, processing, analysis, quality evaluation, and reporting. Concentrations of contaminants reported represent the true concentrations in the media sampled plus the measurement error, which can be minimized but not eliminated. Though measurement error might not be significant in many cases, it is important to assess/compare the contribution of measurement error to the total error in individual investigations. The analytical results of quality control samples are used to estimate accuracy and precision, the quantitative descriptions of measurement error and bias.

##### B-1.1.1 Overall Precision

Precision is a measure of the reproducibility of measurements under a given set of conditions. In the field, precision is affected by sample collection procedures and by the natural heterogeneity of the matrix. Overall precision (field and laboratory) can be evaluated by the use of duplicate samples collected in the field. Greater precision is typically required for analytes with very low action levels that are close to background concentrations. Allowable laboratory precision for water samples is defined as having a relative percent difference (RPD) of less than or equal to 20%. Field precision is the difference between overall precision and laboratory precision. Table B-1 summarizes the precision for the FY 2006 round of groundwater monitoring. Using the following formula, the RPD was calculated only for samples that were true positive values for both the initial sample and the field duplicate:

$$RPD = \frac{|S - D|}{\frac{S + D}{2}} \times 100 \quad (B-1)$$

where

- S = sample  
D = duplicate.

Table B-1. Overall precision for Fiscal Year 2006 analytical data.

Analyte	Sample	Duplicate	Units	RPD (%)
Barium	46.5	53	µg/L	13.07
Cadmium	0.25	0.26	µg/L	3.92
Lead	7.2	7.6	µg/L	5.41
Chromium	10.3	16.1	µg/L	43.94

RPD = relative percent difference

As can be seen from the data in Table B-1, the RPD only exceeds 20% for the chromium, but the chromium concentrations are near the detection limit; therefore, the overall precision of the FY 2006 data is considered acceptable.

### B-1.1.2 Overall Accuracy

Accuracy is a measure of bias in a measurement system. Accuracy is affected by the methods used for sample preservation, sample handling, field contamination, and the sample matrix. The effects of the first three are evaluated using the field blank, trip blank, and equipment rinsate results. The presence of a contaminant in the field blank, trip blank, or rinsate reveals that cross-contamination has occurred.

Laboratory accuracy is ensured through the use of standard methods and the use of calibration standards from the National Institute for Standards and Technology. All instrumentation is calibrated before use in accordance with the procedures outlined in the analytical methods required by the Idaho National Laboratory (INL) Sample and Analysis Management (SAM) statements of work. Laboratory accuracy is assessed through the use of matrix spikes and laboratory control samples. The number of laboratory quality control samples is specified in the analytical methods employed and in the INL SAM statements of work. Evaluation criteria for the quality control samples are specified in data-validation technical procedures administered by the INL SAM Office. Samples analyzed in accordance with U.S. Environmental Protection Agency (EPA) Contract Laboratory Program protocol also are validated in accordance with that protocol. For the FY 2006 data set, the overall accuracy of the analyses is acceptable.

### B-1.1.3 Representativeness

Representativeness is a qualitative parameter that expresses the degree to which the sampling and analysis data accurately and precisely represent the characteristic of a population parameter being measured at a given sampling point or for a process or environmental condition. Representativeness is evaluated by determining whether field data and physical samples were collected in such a manner that the resulting data appropriately measure the media and phenomenon to be studied.

For the FY 2006 sampling activity, all measurements were obtained in accordance with established EPA and INL SAM protocol. Trained personnel used established INL procedures to collect the physical samples.

### B-1.1.4 Completeness

Completeness is a measure of the quantity of usable data collected during the field sampling activities. The Groundwater Monitoring Plan (DOE-ID 2004) requires an overall completeness goal of 90% for this project. For FY 2006, eight of nine wells were sampled for metals and three wells were

sampled for volatile organic compounds. A total of 11 of 12 possible analyses were completed, resulting in a completeness of 92%.

#### **B-1.1.5 Comparability**

Comparability is a qualitative characteristic that refers to the confidence with which one data set can be compared to another. At a minimum, comparable data must be obtained using unbiased sampling designs. If sampling designs are biased, the reasons for selecting another design should be well documented. Data comparability for this sampling activity was ensured through the following efforts:

- All data sets contained the same variables of interest
- All measurements were taken and results reported using common units
- Similar analytical procedures and quality assurance measures have been used
- All field and laboratory instrumentation had similar or better detection limits than those historically used
- All samples were collected following established INL procedures
- Wells selected for sampling are identical to those historically chosen.

Samples were collected in the November–December timeframe, which was similar to the FY 2004 and FY 2005 sampling events but different from historical sampling rounds that occurred in April, July/August, October, and January. However, historical data collected at other INL sites indicate that contaminant concentrations are unaffected by seasonal factors.

### **B-1.2 Data Validation**

Method data validation is the process whereby analytical data are reviewed against set criteria to ensure that the results conform to the requirements of the analytical method and any other specified requirements. For the FY 2006 sampling activity, all laboratory data were validated to Level A according to established INL SAM and EPA protocols. The limitations and validation reports were previously transmitted to the Agencies (EPA and DEQ) in February 2006. No major problems were identified during this method validation process.

## **B-2. REFERENCE**

DOE-ID, 2004, *Groundwater Monitoring Plan for the Waste Area Group 5 Remedial Action*,  
DOE/ID-10779, Rev. 2, U.S. Department of Energy Idaho Operations Office, September 2004.